

WHAT IS CLAIMED IS:

1. A liquid crystal panel having a liquid crystal layer sandwiched between a pair of substrates wherein:

5        said liquid crystal layer comprises a liquid crystal and a cross-linked resin; and

      said cross-linked resin comprises a cross-linked structural part adhered to a liquid crystal layer (adhered, contacting surface (adhered, cross-linked structural 10 part) and a terminal part rising from the liquid crystal layer (rising terminal part) and a liquid crystal layer contacting surface (rising terminal part)).

2. A liquid crystal panel according to claim 1, wherein said liquid crystal layer is formed by cross-linking, in the presence of a liquid crystal, a resin composition comprising one or more first compounds having a cross-linkable structural part, and a hydrophobic terminal part with a straight-chain section

15        having three or more carbon atoms (hydrophobic, long-chain terminal part).

20        3. A liquid crystal panel according to claim 2, wherein the cross-linkable structural part of said first compound or compounds comprises a polar-group 25 structural part.

4. A liquid crystal panel according to claim 3,

wherein said polar-group structural part does not generate impurity ions.

5. A liquid crystal panel according to claim 2,  
5 wherein said resin composition in the liquid crystal layer is in the range of from 0.1 to 10 % by weight.

6. A liquid crystal panel according to claim 2,  
10 wherein said hydrophobic, long-chain terminal part is in the range of from 50 to 95 moles based on 100 moles of the first compound or compounds.

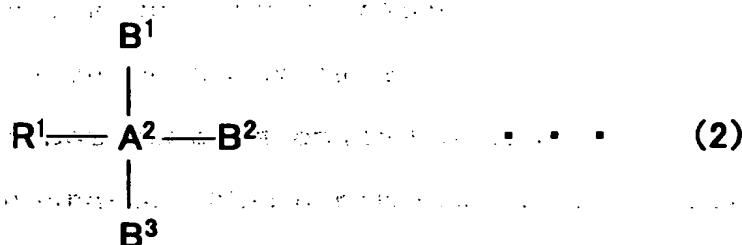
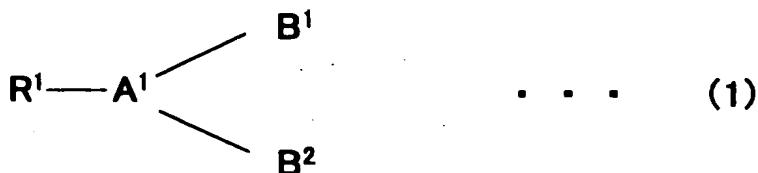
7. A liquid crystal panel according to claim 1,  
15 wherein said liquid crystal has a negative dielectric constant anisotropy.

8. A liquid crystal panel according to claim 2,  
20 wherein said hydrophobic, long-chain terminal part has an alkyl or alkoxy group having from 6 to 18 carbon atoms.

9. A liquid crystal panel according to claim 2,  
25 wherein said cross-linkable structural part of the first compound or compounds has two or more polymerizable double bonds per molecule.

10. A liquid crystal panel according to claim 2,

wherein at least one compound represented by formula (1) or (2) below is included as the first compound or compounds,



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(in formulae (1) and (2),  $R^1$  is a hydrophobic, long-chain terminal part;  $A^1$  is a trivalent group comprising an aliphatic chain that may be branched, an aromatic ring that may have a substituting group, an alicyclic ring that may have a substituting group, or nitrogen;  $A^2$  is a tetravalent group comprising an aliphatic chain that may be branched, an aromatic ring that may have a substituting group, or an alicyclic ring that may have a substituting group;  $B^1$ ,  $B^2$  and  $B^3$  are, each, a cross-linkable structural part; and  $R^1$ ,  $B^1$ ,  $B^2$  and  $B^3$  can be selected independently from each other).

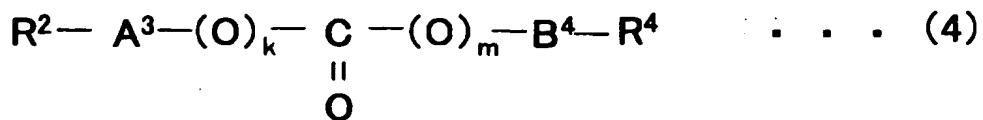
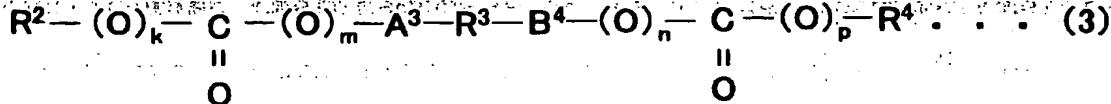
11. A liquid crystal panel according to claim 2,  
wherein said cross-linkable structural part of the  
20 first compound or compounds contains at least one

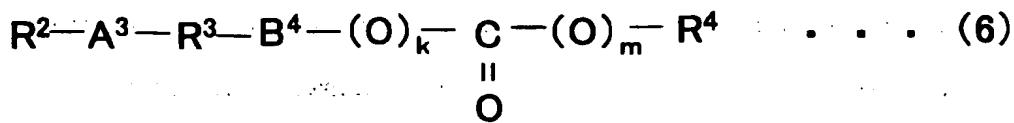
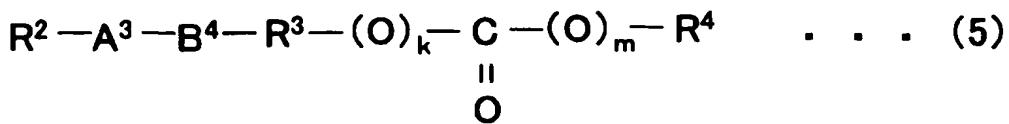
benzene ring structure bonded to a polymerizable group directly or via a carbon atom.

12. A liquid crystal panel according to claim 2,  
5 wherein said one or more first compounds comprise a second compound with a cross-linkable structural part and substantially without a hydrophobic, long-chain terminal part.

10 13. A liquid crystal panel according to claim 12, wherein  
wherein said second compound comprises at least one compound having an aromatic ring and at least one carbonyl group, and are selected from respectively.

15 14. A liquid crystal panel according to claim 13,  
wherein at least one compound selected from the group consisting of the compounds represented by formulae (3) to (6) below is included as the second compound,



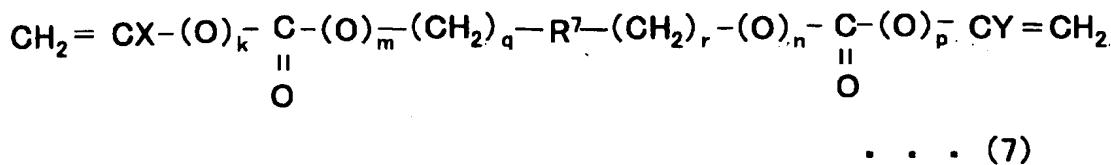


(in formulae (3) to (6),  $A^3$  and  $B^4$  are, independently from each other, a vinylene group or a propenylene group;  $R^3$  is a divalent group;  $R^2$  and  $R^4$  are, independently from each other, hydrogen, an alkyl group that may be branched or an aromatic ring that may be unsubstituted; at least one of  $R^2$ ,  $R^3$  and  $R^4$  is an aromatic ring;  $k$ ,  $m$ ,  $n$  and  $p$  are, independently from each other, 0 (zero) or 1; and  $R^2-R^4$ ,  $A^3$ ,  $B^4$ ,  $k$ ,  $m$ ,  $n$  and  $p$  can be selected independently from each other).

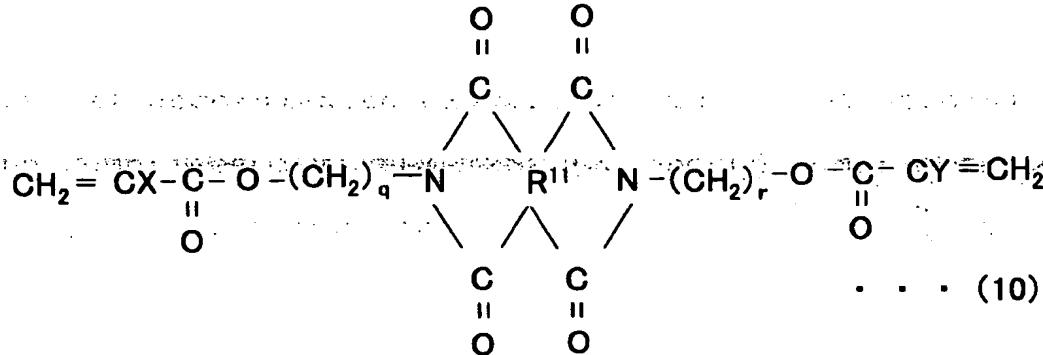
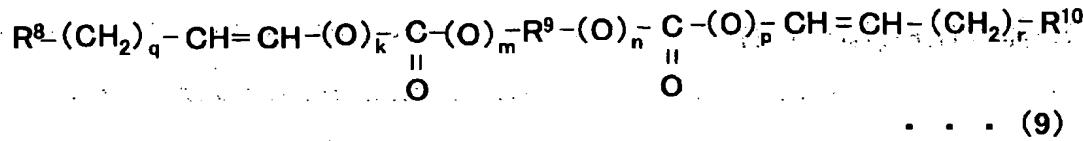
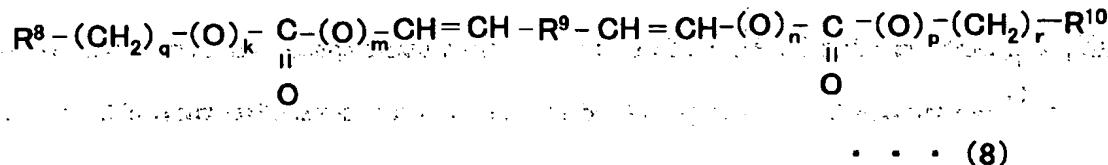
15. A liquid crystal panel according to claim 12, wherein said second compound comprises a five-member ring structure.

16. A liquid crystal panel according to claim 15, wherein said five-member ring structure in the second compound is an acid anhydride structure or an imide structure.

17. A liquid crystal panel according to claim 15, wherein at least one compound selected from the group consisting of the compounds represented by formulae (7) to (10) below is included as the second compound,



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(in formulae (7) to (10), X and Y are, each

10 independently, hydrogen or a methyl group; R<sup>7</sup> is a divalent organic group having a five-member ring

structure;  $R^8$  and  $R^{10}$  are hydrogen or an organic group;  $R^9$  is a divalent organic group; at least one of  $R^8$ ,  $R^9$  and  $R^{10}$  has a five-member ring structure;  $R^{11}$  is a tetravalent organic group constituting a

5 tetracarboxylic acid residue;  $k$ ,  $m$ ,  $n$  and  $p$  are, independently from each other, 0 (zero) or 1;  $q$  and  $r$  are, independently from each other, an integer not less than 0 (zero) and not more than 6; and  $R^8-R^{10}$ ,  $k$ ,  $m$ ,  $n$ ,  $p$ ,  $q$  and  $r$  can be selected independently from each other).

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18. A liquid crystal panel according to one of claims 1 to 17, wherein said liquid crystal tilts while the tilting direction is regulated by uneven parts or slits of an electrode or electrodes when voltage is applied.

19. A method for manufacturing a liquid crystal panel having a liquid crystal layer sandwiched between a pair of substrates, wherein a resin composition comprising one or more first compounds having a cross-linkable structural part and a hydrophobic terminal part with a straight-chain section having three or more carbon atoms (hydrophobic, long-chain terminal part),

20 is cross-linked in the presence of a liquid crystal to form the liquid crystal layer, so that a cross-linked resin in the liquid crystal layer thus formed is made

to comprise a cross-linked structural part adhered to a liquid crystal layer contacting surface (adhered, cross-linked structural part) and a terminal part rising from the liquid crystal layer contacting surface 5 (rising terminal part).

20. A method for manufacturing a liquid crystal panel according to claim 19, wherein said cross-linkable structural part of the first compound or 10 compounds comprises a polar-group structural part.

21. A method for manufacturing a liquid crystal panel according to claim 20, wherein said polar-group structural part does not generate impurities. 15

22. A method for manufacturing a liquid crystal panel according to claim 19, wherein said resin composition in the liquid crystal layer is in the range of from 0.1 to 10 % by weight. 20

23. A method for manufacturing a liquid crystal panel according to claim 19, wherein said hydrophobic, long-chain terminal part is in the range of from 50 to 95 moles based on 100 moles of the first compound or 25 compounds.

24. A method for manufacturing a liquid crystal

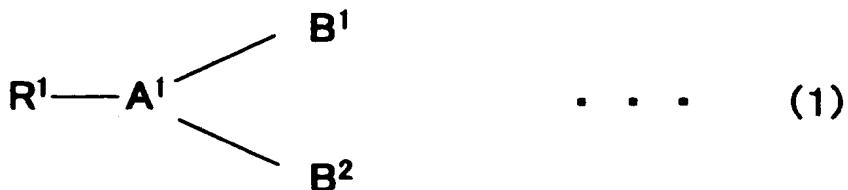
panel according to claim 19, wherein said liquid crystal has a negative dielectric constant anisotropy.

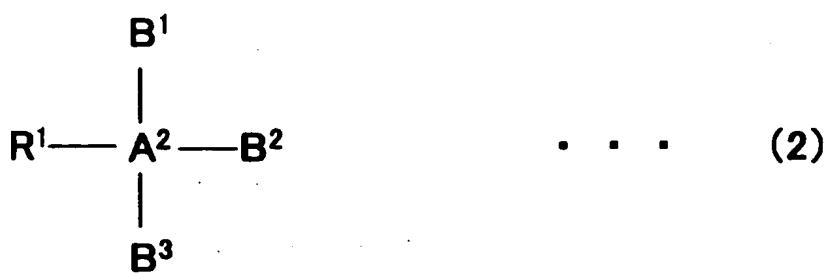
25. A method for manufacturing a liquid crystal panel according to claim 19, wherein said cross-linking is performed by an active energy ray.

26. A method for manufacturing a liquid crystal panel according to claim 19, wherein said hydrophobic, long-chain terminal part has an alkyl or alkoxy group having from 6 to 18 carbon atoms.

27. A method for manufacturing a liquid crystal panel according to claim 19, wherein said cross-linkable structural part of the first compound or compounds has two or more polymerizable double bonds per molecule.

28. A method for manufacturing a liquid crystal panel according to claim 19, wherein at least one monomer compound represented by formula (1) or (2) below is included as the first compound or compounds,





(in formulae (1) and (2),  $R^1$  is a hydrophobic, long-chain terminal part;  $A^1$  is a trivalent group comprising an aliphatic chain that may be branched, an aromatic ring that may have a substituting group, an alicyclic ring that may have a substituting group, or nitrogen;  $A^2$  is a tetravalent group comprising an aliphatic chain, an aliphatic ring that may be branched, an aromatic ring that may have a substituting group, or an alicyclic ring that may have a substituting group;  $B^1$ ,  $B^2$  and  $B^3$  are, each, a cross-linkable structural part; and  $R^1$ ,  $B^1$ ,  $B^2$  and  $B^3$  can be selected independently from each other).

29. A method for manufacturing a liquid crystal panel according to claim 19, wherein said cross-linkable structural part of the first compound or compounds contains at least one benzene ring structure bonded to a polymerizable group directly or via a carbon atom.

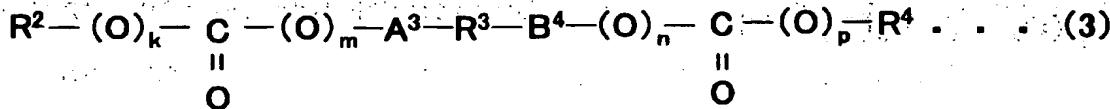
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30. A method for manufacturing a liquid crystal panel according to claim 19, wherein said one or more

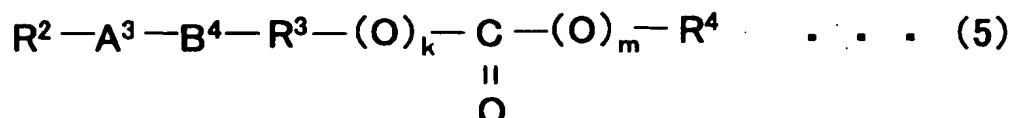
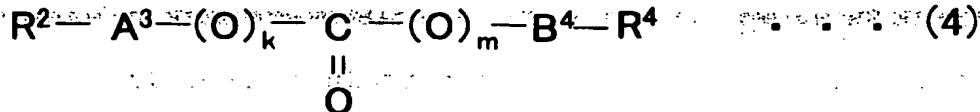
first compounds comprise a second compound with a cross-linkable structural part and substantially without a hydrophobic, long-chain terminal part.

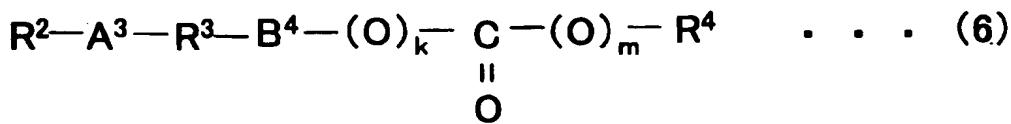
5 31. A method for manufacturing a liquid crystal panel according to claim 30, wherein said second compound comprises at least one aromatic ring and at least one carbonyl group, respectively.

10 32. A method for manufacturing a liquid crystal panel according to claim 31, wherein at least one of the compounds selected from the group consisting of the following three groups of compounds represented by formulae (3) to (6) below is included as the second compound,



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(in formulae (3) to (6),  $A^3$  and  $B^4$  are, independently from each other, a vinylene group or a propenylene group;  $R^3$  is a divalent group;  $R^2$  and  $R^4$  are, independently from each other, hydrogen, an alkyl group that may be branched or an aromatic ring that may be substituted; at least one of  $R^2$ ,  $R^3$  and  $R^4$  is an aromatic ring;  $k$ ,  $m$ ,  $n$  and  $p$  are, independently from each other, 0 (zero) or 1; and  $R^2-R^4$ ,  $A^3$ ,  $aB^4$ ,  $rk$ ,  $rm$ ,  $un$  may represent 15 and  $p$  can be selected independently from each other).

33. A method for manufacturing a liquid crystal panel according to claim 30, wherein said second compound comprises a five-member ring structure.

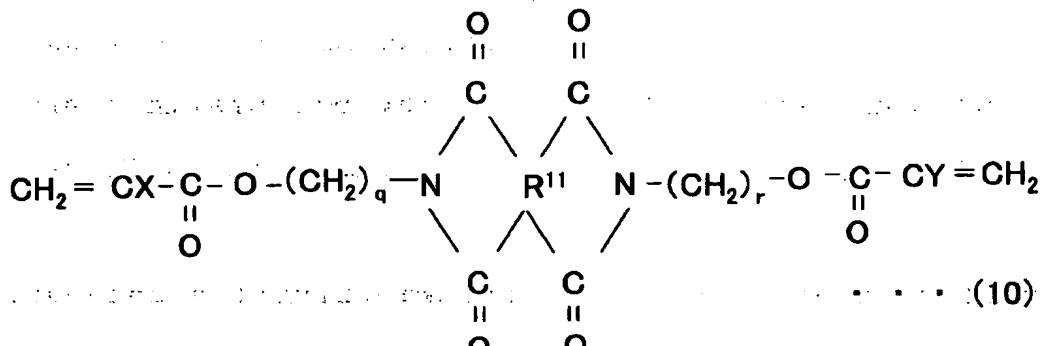
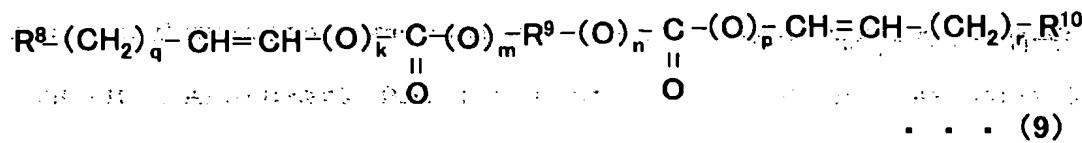
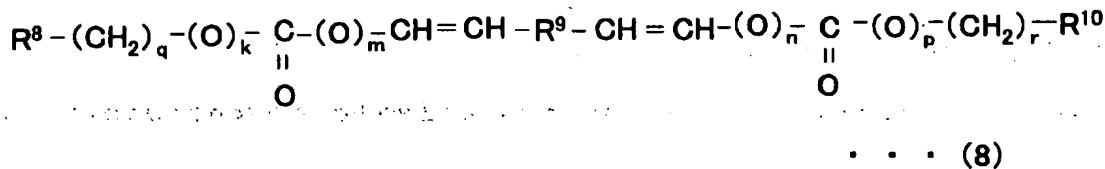
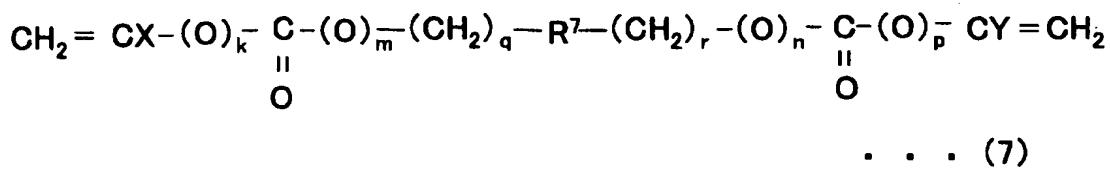
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34. A method for manufacturing a liquid crystal panel according to claim 33, wherein said five-member ring structure in the second compound is an acid anhydride structure or an imide structure.

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35. A method for manufacturing a liquid crystal panel according to claim 33, wherein at least one compound selected from the group consisting of the compounds represented by formulae (7) to (10) below is

included as the second compound,



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(in formulae (7) to (10), X and Y are, each independently, hydrogen or a methyl group; R<sup>7</sup> is a divalent organic group having a five-member ring structure; R<sup>8</sup> and R<sup>10</sup> are hydrogen or an organic group; R<sup>9</sup> is a divalent organic group; at least one of R<sup>8</sup>, R<sup>9</sup> and R<sup>10</sup> has a five-member ring structure; R<sup>11</sup> is a

tetravalent organic group constituting a tetracarboxylic acid residue; k, m, n and p are, independently from each other, 0 (zero) or 1; q and r are, independently from each other, an integer not less than 0 (zero) and not more than 6; and  $R^8-R^{10}$ , k, m, n, p, q and r can be selected independently from each other).